

Use of an Enterprise Wide Electronic Patient Record

Steven F. Mandell, MS, MLA, Stephanie Reel, MBA, and Sherrie Szekalski, BA
The Johns Hopkins Health System, Baltimore, Maryland

Background. The Johns Hopkins Medicine Center for Information Service's (JHMCIS) Electronic Patient Record Project (EPR) was conceived to provide fast and efficient access to every patient's record across the Hopkins' continuum of care. The EPR was developed by a select group of the Hopkins' clinical faculty and JHMCIS programming staff using a client-server architecture, built in Microsoft Visual Basic 3.0, and deployed on a Microsoft windows NT platform. The client has a Graphical User Interface (GUI) which provides an elegant interaction to an array of functions that are seamlessly tied to "servers" across the enterprise from microcomputers to an Amdahl mainframe. The basic architecture is supported with a middle layer of Remote Stored Procedures which are stored in a "Book of Calls" and facilitate robust inter-platform dialog and sub-second response time.

System. JHMCIS uses Microsoft SMS technology to "push" EPR software to selected client workstations throughout the enterprise. EPR may be delivered to Public Workstations deployed by JHMCIS, or to secondary SMS servers managed by departmental LAN administrators, who, in turn, "push" the software to selected private clinical workstations. Any clinician with appropriate rights, using EPR has the following features available to her/him:

- Patient selection by patient identification number , patient name, provider, inpatient census by nursing unit, or outpatient census by clinic.
- View of patient's Problems, Medications, and Allergies with on-line capability to add, modify, change.
- View listing of all inpatient and outpatient visits with "drill down" to associated information.
- View all Laboratory Results posted within last two years, with stop-light highlighting of out of range, panic values and all associated pathology comments.

Searchable by department (pathology, micro, etc.) and by date range.

- View of all Radiology Reports posted within the past seven years. Searchable by department and date range.
- Ability to create, modify, print, and electronically sign and/or view an array of documents including Clinic Notes, Operative Notes, Discharge Summaries, etc.
- Clinicians may also dictate into a central dictating service, have those notes electronically posted to EPR, and then view, modify, print, and electronically sign them.
- Ability to create, modify, and print a Health Maintenance Record, including Immunizations.
- View of other patient documentation including echocardiograms, EEGs, ECGs, etc.

Conclusions. The EPR is being used by over 2,000 clinicians in clinics, nursing units, physician's offices and in the medical records department. The Johns Hopkins Health System is a large complex academic medical institution with tens of thousands of inpatient visits and over a million outpatient visits per year. Its physical plant is dispersed throughout the state of Maryland. There is no single place that a patient's medical record is stored. Even within the main East Baltimore Campus, there is no single unified patient record. As such, EPR is becoming the primary source for fast, reliable, and complete information. Primary care givers and consultants alike are using the system to access the data, information, and text documents delineated above to enhance patient care. The global access allows care givers in both inpatient and outpatient settings to see visit histories, lab values, etc. at an instant. At this time, many of the details of the patient encounter are not yet available, but as more information sources are linked, the goal of an enterprise wide electronic patient record will be achieved.